

# ATOMIC ENERGY

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Dear Sir:

Pointing out that the United States "lost the major secret of the atom at Hiroshima Aug. 6, 1945", Dr. Lloyd V. Berkner, Brookhaven National Laboratory, N.Y., urged before the American Physical Society in Washington last week that proper defenses be developed by the United States against atomic attack. These defenses, he said, comprise new weapons and tactical procedures that would plug the vital gaps of conventional defensive systems and bring costs within reason. This cannot be done by the military, or within the orbit of military influence, he asserted. Proof of this is the present lack of interest of the military in ideas which have been put forth by responsible scientists--ideas, he pointed out, which may be vital to the survival of the United States. It is only in dire emergency, he noted, that the military finally shows interest; but, in this atomic age, since such developments take time, it will be too late. Dr. Berkner advocated a research organization for new weapons independent of military control; that could deal with the military on equal terms; that would have access to the President, the National Security Council, and top-level planning agencies of the Government; and that would have the confidence of all areas of American science.

In the seventh nuclear detonation of the current series at the testing ground in Las Vegas, Nev., last fortnight a nuclear device was exploded atop a 300-ft. tower, in a maneuver involving some 2,400 Army combat troops. It was the twenty-eighth atomic explosion in the United States, and was an effort to assemble additional data on certain aspects of weapon behaviour.

Great Britain is constructing a new nuclear reactor at Sellafield, where two other nuclear reactors have been in operation since 1949. It will be of a type similar to the ones now in operation at Sellafield. (Other nuclear work in Britain; page 4 this LETTER.)

A symposium devoted to modern physics will be held at Oak Ridge this Summer; it will be the fifth annual symposium to be held there. To run from Aug. 24-29, the symposium will consist of several lectures within the general fields of mesons and ultra high energy phenomena, as well as being concerned with electromagnetic radiations. This will be the second in the series of Oak Ridge summer symposia to be devoted to modern physics. The first symposium five years ago was concerned with this field, and subsequent gatherings have been devoted to a review of modern chemistry, and discussions of the role of atomic energy in engineering and in agriculture. Sponsored jointly by the Oak Ridge National Laboratory, and the Oak Ridge Institute of Nuclear Studies, additional information may be obtained from the Institute at P.O. Box 117, Oak Ridge.

The 20th century may be "closing time for the human race" Thomas E. Murray, USAEC Commissioner told an audience at Manhattan College, New York, last fortnight. Mr. Murray was discussing atomic weapons, and their potentialities.

BUSINESS NEWS...in the nuclear energy field...

EXPLAINS USE OF RADIOTRACERS IN PIPE LINE OPERATION-Use in pipeline operation of radioactive tracers reduces waste volume by one-third, effecting savings of hundreds of barrels per day in products so shipped, C. V. Baxter, Salt Lake Pipe Line Co., told a meeting of the American Petroleum Institute in Kansas City, Mo., last fortnight. (Baxter's paper, delivered by him, was prepared by D.E. Hull, and B.A. Fries, California Research Corp.) It concerned the use of such tracers on the Salt Lake City-Pasco, Wash., line.)

In transporting a number of different petroleum products through a common pipe line, it is necessary to distinguish between them for segregation at terminals or take off, the paper pointed out. And the more accurately the interface can be located, the lower the contamination of one product by another, and the smaller the mixed fluids which must be stored and re-refined, it said. The reason for the use of a radioactive tracer, Baxter declared, is that it is independent of the physical properties of the products, and will signal the location of the interface and indicate the extent to which adjacent products have come mingled with each other. The tracer can, of course, be detected instantly through the walls of the pipe. Equipment to inject the radioactive material into the line is well shielded, he pointed out, and once in the pipe line, radiation levels are extremely low. It is possible to measure the intermixture of the petroleum products by measuring the radioactivity and the concentration of tracer at any point in a developed interface, the paper stated. And since the amount of mixing of one component into the other can be determined at any point, breaks between tenders can be made with any desired limit of contamination, it was observed. The authors declared that no unusual maintenance features, such as radioactive contamination, has been encountered in this line.

NEGOTIATIONS COMPLETED FOR REACTOR POWER STUDY-Final agreement was made last month of the nuclear reactor study which Pioneer Service & Engineering Co., Chicago, together with Foster-Wheeler Corp., New York, will conduct during 1953. The USAEC, with whom the agreement was made, will now permit the firms to make a survey of the feasibility of design, construction, and operation, by private means, of nuclear reactors to produce power. (Pioneer and Foster-Wheeler, proposed some time ago to join similar investigations which other firms are making of such feasibility; it is only recently that their proposal was formally accepted.) Pioneer acts as design engineers and consultants in all phases of the electric power business for the electric utility industry. For this reactor study, Pioneer added a nuclear physicist and engineer specialist to its staff. In addition, several of Pioneer's regular clients, including utilities in the mid-west and western states, have agreed to support the study. Foster-Wheeler's activities comprise the field of design, and manufacture, of steam generation, heat exchanger, petroleum refining, and chemical process equipment. (Chemical processing plays a much bigger role in nuclear power than in conventional power.)

ATOMIC POWER DIVISION ESTABLISHED-The Babcock & Wilcox Company, because of its continuing interest and participation in atomic power projects, has now set up an atomic power division. Current work by Babcock & Wilcox, in this field, includes work on the development of the propelling mechanism for nuclear powered submarines, as well as advanced studies on the application of atomic power to larger Naval surface vessels.

ATOMIC BOMB PROTECTION PLAN OUTLINED-The new Federal Civil Defense Administrator, Mr. Val Peterson, outlined to a group of industrial representatives in New York last week what he termed "a new plan to protect against atomic bombing of industrial targets". He said the purpose of the new program was to (1) Advance civil defense preparedness of industrial plants in terms of protection of people, and protection of physical equipment, and (2) to stimulate the cooperation of industry with civil defense authorities at the state and local levels to strengthen the preparedness of the community. He said a steering committee had been selected, among industrial leaders with whom the plan had been previously discussed, and that it had been decided to use Hartford, Conn., as the site of a pilot operation.

Elaborating on what he thought should be done for civil defense, Mr. Peterson said he believed that the Government should give the public more information on the dangers ahead. "Too frequently," he noted, "matters have been classified as top secret or otherwise simply for the convenience of the agency so marking them, rather than the true interest of the people".

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

FROM THE MANUFACTURERS-Lead shield, model LH-3, designed especially for scintillation counting of planchets. One and one-half inches of lead surround the counter and sample, while a two-position slide automatically centers planchet recesses under counter. Planchets up to 2" in diameter and  $\frac{1}{8}$ " deep may be used. The slide moves on steel balls; one sample may be counted while the other is being replaced, the manufacturer states. --Nuclear Research & Development, Inc., St. Louis 14, Mo.

Decimal scaler, Model 2105, designed for a wide variety of uses in radioactivity measurement; can be used for Geiger or scintillation counting. Said to incorporate new design features in the radio frequency high voltage supply. The instrument is entirely direct reading, utilizing two plug-in decimal counting units, and a four-digit mechanical register. The high voltage is variable from 500 to 2500-volts; standard  $\frac{1}{2}$ -volt input sensitivity is provided.--Berkeley Scientific Div., Beckman Instruments, Richmond, Calif.

Count rate computer, model C-11, to be used as an accessory with any scaler to provide a direct reading of average count rate. The instrument has five automatic preset count ranges; a "count-stop-clear" lever controls both the scaler and computer. At conclusion of counting, a pointer on an 8" dial gives the average count rate reading directly; no multiplication, interpolation, addition, or division is necessary. Said to save 75% of counting time in clinical investigations, this C-11 computer also finds application in routine sample counting. The instrument is housed in a portable, sloping, welded steel cabinet; no vacuum tubes are employed... Now available from this same manufacturer are sets of punched cards classifying many of the properties of the almost 1200 known nuclides. The cards are punched in the McBee Keysort system. This allows rapid manual selection of nuclides by nine major characteristics: atomic number, mass number, chemical symbol, stability or radioactivity, availability, type of radiation, half-life, and energy of radiations. This system permits selection of radioisotopes by half-life (42 sub-classes); alpha energy (9 sub-classes); beta energy (19 sub-classes); and gamma energy (19 sub-classes), as well as availability. (Bonino and Laing prepared this system and have described it in the literature). The manufacturer believes that the system will save time in selecting a suitable isotope for a particular experiment, or in identifying an isotope from its observed properties. The system is supplied complete with sorting trays and probes; revisions will be offered when necessary --Radioactive Products, Inc., Detroit 26, Mich.

NOTES: New catalogues, now issued by Radiation Counter Laboratories, Skokie, Ill., and Nuclear-Chicago (formerly Nuclear Instrument & Chemical Corp.) Chicago, Ill., present products of these manufacturers.

Recently shown in London by the Ministry of Supply (which oversees Great Britain's nuclear energy work) at an exhibit of work done under Ministry contracts, were plastics which has been subjected to irradiation in the nuclear reactor at Harwell (Atomic Energy Research Establishment). The effect of the high-energy radiation on these long-chain polymers had resulted in virtually new materials. Ministry officials feel that this may lead to the possibility of "tailoring" plastics to suit particular requirements.

Also shown at this exhibit by the Ministry (as above) was a small self-contained radiation monitor, comprising an ionization chamber, glass-enclosed high-value resistors, etc., for civil defense work. Measuring approximately 9"x4"x6", the monitor weighs 9-lbs., and is carried in a shoulder knapsack.

Various isotopic tracer methods, described to the American Society of Biological Chemists, meeting in Chicago last month, demonstrated a number of isotope tracer applications in the field of biochemical research. (The Society was told that tracer techniques are invaluable in biosynthetic and metabolic studies since they enable the investigator to follow the path of labeled compounds through complex biological systems.) One investigator, M. V. Simpson, Washington Univ. School of Medicine, St. Louis, described an investigation into protein biosynthesis mechanisms, using C-14 labeled amino acids. Another investigation, reported by S. Soloway, Public Health Research Institute, New York, concerned the use of N-15 and C-14 as tracer elements, in investigating choline and betaine in the animal body.

NUCLEAR WORK ABROAD...

GREAT BRITAIN: Reflecting this country's interest in nuclear energy and associated equipment were recent exhibits by British instrument manufacturers at the Milan (Italy) International Samples Fair last month.

A fast scaling unit incorporating a Dekatron register was shown by Labgear (Cambridge) Ltd., Willow Place, Cambridge. A 30 tube electronic unit, for selecting, counting, and registering positive electrical pulses (of amplitudes above 5-volts) up to a total count of 999,999, at a maximum rate of 700 per second, was shown by Dynatron Radio, Ltd., Perfecta Works, Ray Lea Road, Maidenhead. A pulse generator, for investigating the transient response of circuits in the design laboratory, or for the production testing of complete equipment, was shown by Dawe Instruments, Ltd., Uxbridge Rd., Hanwell, London. A radiation monitor, providing visual indication of radioactive emission by means of a meter, and audible indication by a loud-speaker, was shown by Airmec, Ltd., High Wycombe, Buckinghamshire. A scaling unit, designed for counting at relatively low rates, was shown by Ericsson Telephones, Ltd., Beeton, Nottingham. Various G-M counter tubes, including counters for use in bone and brain surgery, for low energy beta rays, for liquid samples, etc., were shown by 20th Century Electronics, Ltd., Shaftesbury Ave., London. A line operated ratemeter, which will operate if required with any suitable pen recorder or as a dial reading ratemeter, was shown by Nucleonic & Radiological Developments, Ltd., Leadenhall St., London. A logarithmic ratemeter; a monitor for the detection of gamma active material passing through a standard doorway; and other units, were shown by Fleming Radio Developments, Ltd., 18 Laystall St., London. Various photo-multiplier tubes, for scintillation counting, were shown by E.M.I. Laboratories, Ltd., Blyth Road, Hayes, Middlesex. A scintillation counter (medical), for thyroid measurements and blood circulation studies, said to give high efficiencies with radio-iodine, was shown by Ekco Electronics, Ltd., Southend-on-Sea, Essex.

THE NETHERLANDS: A group of firms here now intend to explore the potentialities of nuclear energy. The companies involved include Philips Electrical Company; Batteafseche Petroleum Maatschappij (one of the three major operating companies of Royal Dutch Shell; the state mines; Royal Dutch Airlines; and Kema (a combine set up by the country's electrical producers). With these commercial firms will be associated the government-sponsored Foundation for Fundamental Research into Matter. It is believed that agreements among this group will be completed by September.

RAW MATERIALS...radioactive minerals for nuclear work...

CANADA- Increasing Canada's output of uranium oxide by some 140%, the new Beaverlodge operation of Eldorado Mining and Refining has now gone "on stream". The new plant, which has an initial capacity of some 500 tons per day, may be increased to 700-750 tons because of generous designing. (Since this Beaverlodge increased capacity is in addition to the 75% increase in production which went into effect at Eldorado's Port Radium operation on Great Bear Lake a year ago, Canada's output is now substantially enlarged.)

Ameranium Mines, which has a uranium prospect on the southeast shore of Beaverlodge Lake, Northern Saskatchewan, expects to resume exploration there, the firm announces....At the holdings of La Ronge Uranium Mines, in the Lac LaRonge area of Saskatchewan, surface exploration is ready to start, an official of the company states. On the firm's original group, staked from its original 25-sq. mile concession, a potential of some 8,000,000 tons of low grade radioactive material has been indicated to a depth of 165-ft. over a large mineralized area, the official further has indicated.

ARGENTINA- A decree has now been issued by the National Commission of Atomic Energy stating that it will buy all uranium produced in Argentina, and that all holders of stocks must sell them to the Commission. A sliding scale of prices has been fixed according to the content of the element in one ton of the ore, and it is valid for one year from publication date.

INDIA- According to a report recently submitted to Parliament by the Ministry of Natural Resources and Scientific Research, important uranium deposits are said to have been found at Bihar.

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Uranium in the East Walker River area, Lyon County, Nev. Geological Survey bulletin no. 988-C. (35¢).....Radioactivity in some oil fields in southeast Kansas. Geological Survey bulletin no. 988-E.....Checklist of U. S. Government publications on civil defense. A comprehensive listing of all presently available publications. (n/c).....Available from Superintendent of Documents, Wash. 25, D.C., at prices indicated.

Fourth List of Reports of Staff Members, Atomic Energy Research Establishment, Harwell. Lists about 30 of the recent publications of Harwell staff.--British Information Services, New York 20, N.Y. (n/c).

Chemical Systems Sensitive to Radiation. Report of work done under contract by I. A. Bernstein, W. G. Rothschild, F. F. Spaulding, E. C. Farmer, of Tracerlab, Inc. (Microfilm \$1.25; photostat \$1.25).....Antibody response of animals exposed to x-radiation. (Microfilm \$1.75; photostat \$2.50).--Library of Congress, Publication Board Proj., Wash. 25, D. C.

ATOMIC PATENT DIGEST....latest U. S. grants in the nuclear field...

Method and apparatus for stereoscopic recomposing and measuring. Comprises, in part, two projectors, each of which independently projects a single image on a screen. Associated equipment is so arranged that the reflected image from one projector is superimposed at the surface of the screen upon the reflected image from the other projector. U. S. Pat. No. 2,635,339, issued April 21, 1953; assigned to United States of America (USAEC).

Process of preparing granular beryllium fluoride. Comprises, in part, contacting a quiescent thin bed of fluffy beryllium hydroxide powder with anhydrous hydrogen fluoride at a temperature of about 35 deg. C., for a period of from 6 to 10 hours, and continuously introducing this hydrogen fluoride under pressure so as to maintain a stoichiometric excess of the hydrogen fluoride above this bed and in contact with it. U. S. Pat. No. 2,635,944 issued April 21st, 1953; assigned to United States of America (USAEC).

Process for preparing powdered thorium. Comprises (in part) treating massive metallic thorium at 600 deg. to 650 deg. C., with hydrogen of slightly super-atmospheric pressure. The temperature is then lowered to 320-deg. to 100-deg. C., while continuing to introduce hydrogen at atmospheric pressure. Subsequently discontinuing the hydrogen supply, increasing the temperature, and reducing the pressure, metallic thorium is produced. U. S. Pat. No. 2,635,956 issued April 21st, 1953; assigned to United States of America (USAEC).

Rare earth separation by anion exchange. Comprises (in part) the steps of absorbing rare earth-citrate complexes from an acidic aqueous citrate solution on a strong base type anion exchange resin possessing exchangeable citrate anions, and selectively eluting each adsorbed rare earth complex in the order of increasing rare earth atomic number with a citric acid solution having a pH value in the range of about 1.5 to 3.0. U. S. Pat. No. 2,636,044 issued Apr. 21, 1953; assigned to United States of America (USAEC).

Device for measuring the coincidences of electrical pulses from different sources. Comprise (in part) the combination of a channel for each source, each channel having means to delay a pulse; means to integrate a pulse; and means to subtract the pulse delayed from the pulse integrated, and means for counting the coincidences of pulses connected to the channels. U. S. Pat. No. 2,636,118 issued April 21st, 1953; assigned to United States of America (USAEC).

Ion source unit. Comprises, in part, a pair of cathodes each having a flat front surface, a hollow cylindrical anode located between these cathodes, with associated circuitry whereby ions are attracted from a region about the axis of this anode, and expelled from the ion source. U. S. Pat. No. 2,636,990 issued April 28th, 1953.

Sincerely,

The Staff,  
ATOMIC ENERGY NEWSLETTER